

BENCHMARKS

THE COMPUTING CENTER

NORTH TEXAS STATE UNIVERSITY
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BACK TO SCHOOL ISSUE

SERVICES AVAILABLE TO USERS OF THE NTSU COMPUTING FACILITIES

The NTSU Computing Center is located in the Information Sciences Building (ISB), Room 119. **Phone Numbers:** Computing Center: (817) 565-2324; Help Desk: 565-4050; Graphics Lab: 565-3479

BENCHMARKS Questions/Contributions, Etc - Claudia Lynch

Information & ID-Codes; Disk Space Problems - Carolyn Goodman

Statistical/Research Support - George Morrow, Scott Barber, Claudia Lynch, Rocky Ward, Panu Sittiwong

Academic ADABAS/COM-LETE - T.B.A.

CRSP & COMPUSTAT Problems - Panu Sittiwong

Student Programming Problems - CSCI Dept., GAB Room 542A; BCIS Dept., BA Room 152

JCL Problems; Password & Operating System Problems; Communication/Terminal Problems - Help Desk

Data Entry; Test Scoring & Analysis - Betty Grise

Administrative Applications - Coy Hoggard

Printout Retrieval - RJE Operators

DIALING UP NTSU COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are:

300/1200 BAUD: (817) 565-3300; 3499

300 BAUD: D/FW METRO 429-6006

1200 BAUD: D/FW METRO 429-9314

The numbers that will accept either 300 or 1200 baud communications have an autobaud feature that requires you to hit the <RETURN> key repeatedly so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, the # prompt will appear on your screen and you can enter one of following CALL commands to connect with the computer of your choice.

CALL 8040 connects with the NAS/8083 (does not support full-screen editing).

CALL 3270 connects with the NAS/8083 through a 3270 protocol converter (supports full-screen editing).

CALL DEC connects with the VAXcluster

CALL 780 connects with the Research VAX

CALL 2000 connects with the HP-2000

NTSU CABLE SYSTEM SCHEDULE

The current configuration of the NTSU cable system is as follows:

Channel 7 - NT Daily. Broadcasts from the NTSU Journalism Department.

Channel 8 - TAGER. Broadcasts go to and from NTSU to other links in this microwave network.

Channel 10 - NTSU Computer System Status Monitor (SSM). Displays the current status of the NAS, VAX, and HP computer systems supported by the Computing Center.

Channel 12 - Sammons Cable. Carries Cable News Network (CNN) unless a special program is requested.

Special broadcasts to and from classrooms can be arranged by the Media Library (565-2484).

HOURS FOR NTSU COMPUTER ACCESS AREAS : FALL 1987*

Days	Times	Location
Sunday	2-10 p.m. Noon-Midnight 2 p.m.-Midnight 1-11 p.m.	ISB 110 Terminal Area Computing Center RJE GAB 550C Graphics Lab
Saturday, Sunday	Noon-1:45 p.m.	College of Business
Monday	7:00 a.m.-Midnight	Computing Center RJE
Tuesday-Saturday	Open 7 a.m. Tuesday (Open 24 hrs/day)	Computing Center RJE
Monday-Thursday	7:30 a.m.-Midnight 8:15 a.m.-11:45 p.m. 8 a.m.-Midnight 8 a.m.-11 p.m.	ISB 110 Terminal Area College of Business GAB 550C Graphics Lab
Friday	7:30 a.m.-6 p.m. 8:15 a.m.-7:45 p.m. 8 a.m.-5 p.m. 8 a.m.-7 p.m.	ISB 110 Terminal Area College of Business GAB 550C Graphics Lab
Saturday	9 a.m.-6 p.m. CLOSE Midnight 2-8 p.m. Noon-5 p.m.	ISB 110 Terminal Area Computing Center RJE GAB 550C Graphics Lab

*Hours may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

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GENERAL INFORMATION

Welcome Back

By Dave Molta, Acting Manager of Academic Computing
(AC04@NTSUVAX)

I'd like to take a moment to welcome everyone back for the start of the 1987-88 academic year. It is our hope that we can contribute to making this a most productive year for students and faculty members by assisting with your computer-related needs. Academic Computing Services is anxious to provide the best service possible and welcomes feedback from the user community. For those of you who are new to NTSU, let me take a moment to fill you in on the services we provide.

Hardware and Operating Systems

The primary computing resources for academic computing at NTSU consist of an IBM-compatible National Advance Systems 8083 dual processor mainframe computer and a Digital Equipment Corporation VAXcluster consisting of two VAX 11/785 minicomputers running under the VMS operating system. The NAS machine supports 3 operating systems for instruction and research: VM/CMS, OS/MVS, and MUSIC; a computer based training system called PHOENIX; and a teleprocessing monitor called COM-LETE. OS/MVS provides batch processing while MUSIC is the primary interactive operating system. CMS is available on a limited basis, most notably for graphics applications using SAS/GRAPH. COM-LETE is used by the College of Business for teaching ADABAS, a database management system.

Access to these and other computers is gained through a cable television-based local area network (LAN) on campus or, from off campus, through telephone lines connected to the LAN. Clusters of terminals are available to faculty and students in the Business Administration Building, General Academic Building, Information Sciences Building, Music Building, and Wooten Hall. In addition, a computer graphics laboratory is located in the basement of the Information Sciences Building.

Software

Academic Computing Services directly supports several major statistical packages for use on the mainframe systems and maintains site licences for SPSS-PC+ and SAS-PC statistical analysis packages for use on IBM-compatible microcomputers. Software from the PC-SIG public domain/shareware library, containing several hundred programs and utilities for IBM-compatible microcomputers, is also available to the user community at no charge. Electronic mail facilities are supported on all mainframe sys-

tems for intercampus communications as well as for communications with several hundred other universities through BITNET, an international communications network. The Computing Center also serves as a repository for a substantial body of machine readable data including the Inter-University Consortium for Political and Social Research (ICPSR) data archives, Standard and Poor's COMPUSTAT, and the Center for Research in Security Prices' CRSP datasets.

Consulting Services

Consulting services are provided by Academic Computing to facilitate the use of campus computing facilities by students and faculty. Experienced consultants are available to assist in the design of instructional and research projects, as well as to provide information and support on a variety of mainframe and microcomputer software packages.

Because of limited staff resources, it is not possible for Academic Computing Services to actually write programs or perform computer-based statistical analyses. Rather, we regularly provide a series of short courses intended to allow you to gain the expertise necessary to use the computer systems on your own (see schedule of classes later in this issue of *Benchmarks*). If you do experience problems, consultants are available to meet with you on an individual basis to help you overcome any difficulties.

New Services Planned

While we are proud of our computer facilities and services here at NTSU, we are constantly striving to make improvements. In line with these efforts, several projects are currently in the works to advance the quality of computing on campus.

- **TEXNET:** In early September, NTSU will become affiliated with TEXNET, a DECnet-based interactive network of over 30 Texas educational and research institutions. TEXNET will provide users with the ability to connect to host computer systems at major universities such as Texas A&M, the University of Houston, and the University of Texas, among others. Once funding issues have been resolved, researchers needing access to supercomputing facilities will be able to submit jobs to the Cray X-MP/24 supercomputer at the UT Center for High-Performance Computing. Future plans call for improved gateway facilities through TEXNET to ARPANET and TELENET.
- **College of Business Laser Printer:** Users who have become frustrated with the delays in getting laser printed

output should see some relief later this semester with the installation of another Hewlett Packard Model 2680A laser printer in the College of Business job output area.

- **Improved Dial-up Access:** By the end of the fall semester, we plan to offer dial-up access to the NTSU LAN at both 2400 and 9600 bps. We are currently beta-testing the new US Robotics 9600 bps rackmount modems which provide high-speed full-duplex communication over ordinary phone lines. We hope to be able to make these modems available to interested students and faculty members through a special arrangement with US Robotics for under \$700 each.
- **Microwave Communications with TCOM:** Also scheduled for this fall is the installation of a microwave communications system between NTSU and its sister institution, the Texas College of Osteopathic Medicine in Fort Worth. In addition to improving the access to our mainframe systems for TCOM faculty and students, the microwave system will also allow us to upgrade our metro-line dial-up facilities to at least 2400 bps.

Look for further details concerning these new services in upcoming issues of *Benchmarks*. If you have questions about current services or future plans, feel free to drop by the Computing Center offices in the Information Sciences Building. §

Help Available in Terminal Access Rooms

If you are new to computing at NTSU, then you should know that there are several public access terminal rooms on campus which are attached to the major mainframe systems. There are consultants available in each of these rooms to help you with problems you may have in trying to connect to or otherwise make use of these systems.

Consultants in all three areas are capable assisting users with problems concerning such topics as logging-on, using editors, and submitting jobs. In addition, staff at the Help Desk in Room 110 of the ISB Science Library can be consulted on areas such as communications with the NTSU Local Area Network (including dial-up problems), PC to mainframe file transfer, and the use of statistical packages. They have familiarity with all of the major mainframe operating systems on campus including MUSIC, VMS, CMS, and COM-LETE. They may also be able to help with common MS-DOS problems.

Consultants in the BA and GAB labs, as opposed to ISB 110 help desk staff, are authorized to help with programming problems and homework assignments. GAB staff tend to focus more on VAX oriented applications, while BA consultants are more familiar with problems associated with the MUSIC and COM-LETE operating systems.

Of course, different individuals in each of these rooms have varying levels of expertise, and while none of these people are experts on everything (and also may not always have time to help you directly), they should be willing and able to direct you to documentation or some other resource(s) that will

enable you to learn how to get the most out of the campus computing systems. §

Research Grant Accounts

By Carolyn Goodman, Computing Center Administrative Services

Do not wait to renew your research grant UserID account!!! If you had a research grant UserID account for fiscal year 1987, you will need to renew your UserID as soon as possible. The new grant account number can be entered later; however, if you do not renew it, your UserID will become deactivated and purged from the system. If you do not have a new pink USERID CHANGE FORM (F-020-02) and wish to renew your USERID, they are available in the Computing Center Main Office, ISB 119. If you have any questions regarding this or other USERID matters, contact me at the Computing Center (565-2324). §

Desktop Publishing Comes to the Computing Center

By Claudia Lynch, *Benchmarks* Editor (AS04@NTSMUSIC)

The Computing Center has joined the Desktop Publishing Revolution and purchased the Xerox Edition of Ventura Publisher, a popular desktop publishing product. In fact, this issue of *Benchmarks* (as well as the previous issue) was produced using Ventura Publisher. Additionally, this issue was printed on a HP LaserJet Series II laser printer.

Since we were changing the body of the newsletter, we decided to change its face also. We asked the Center for Instructional Services to design a new cover for us and we hope you will be as pleased as we are with the result. You can look forward to more exciting developments in the future as our experience with Ventura Publisher increases and we attempt more advanced document design. If you are interested in desktop publishing and would like more information on this topic feel free to contact me at 565-2324. §

Molta Becomes HARDCOPY Product Reviewer

David J. Molta, Acting Manager of Academic Computing, has become a product reviewer for *Hardcopy*, a magazine that provides "Need to Know Solutions for DEC Computing."¹ His first product review appeared in the August 1987 issue (Vol. 7, No. 8) and is titled "Product Review: FEL Computing's Mobius." Mobius is advertised as a "totally transparent micro-to-host integration package that promotes a symbiotic relationship between the two systems."² According to Dave, several other articles have already been delivered to *Hardcopy*, and he is working on at least one more. We look forward to seeing more of Dave's ideas in print and feel honored that we can draw on his talents for this publication as well. §

¹Registered Trademark of *Hardcopy* magazine.

²*Hardcopy*, Vol. 7, No. 8, p. 108

Computing Center Short Courses

The Computing Center is offering the following short courses for the Fall semester. Please pre-register to attend. A maximum of 15 people will be admitted to each of the Introduction to MUSIC/SP classes, parts I & II. A maximum of 20 people will be admitted to each of the remaining classes.

1. Introduction to MUSIC/SP, Part I – MUSIC/SP is the primary interactive operating system employed by most academic users to access the NAS/8083 IBM-compatible mainframe computer at NTSU. MUSIC users have access to a variety of programming languages, a sophisticated word processing system, and several statistical analysis packages. MUSIC also gives you the capability to submit batch jobs to the MVS operating system. Topics covered include gaining access over the Local Area Network, logging on and off, changing your password, and creating, editing, and storing files using the full-screen editor.

Six separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Saturday, September 19: 9–11 a.m.
Instructor: Rocky Ward

Monday, September 21: 6–8 p.m.
Instructor: Panu Sittiwong

Tuesday, September 22: 1–3 p.m.
Instructor: Scott Barber

Monday, October 19: 9–11 a.m.
Instructor: Scott Barber

Tuesday, October 20: 3–5 p.m.
Instructor: Rocky Ward

Wednesday, October 21: 1–3 p.m.
Instructor: Panu Sittiwong

2. Introduction to MUSIC/SP, Part II – This course provides an in-depth look at various useful programs and utilities that are available on MUSIC/SP. Topics covered include accessing on-line help facilities, using electronic mail, routing output to high-speed printers, and writing files to secondary storage such as disk and tape. A working knowledge of MUSIC is required.

Two separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Thursday, September 24: 9–11 a.m.
Instructor: Philip Baczewski

Tuesday, October 27: 6–8 p.m.
Instructor: Philip Baczewski

3. Introduction to IBM Job Control Language (JCL) – This course provides an overview of IBM JCL for users who wish to further their knowledge in this area. It is useful to individuals who plan to run batch jobs (e.g. SAS, SPSS^X, BMDP) on the IBM-compatible mainframe computer.

Two separate two-hour sessions to be held in the Graphics Lab (ISB):

Tuesday, September 22: 3–5 p.m.
Instructor: George Morrow

Wednesday, October 21: 1–3 p.m.
Instructor: George Morrow

4. Introduction to SAS – SAS is one of the most widely implemented data analysis systems within business and education. SAS is particularly well suited for dataset manipulation and includes an extensive procedure library providing a wide range of analytical tools. This course is recommended for individuals who plan to incorporate statistical analyses into their research. Topics covered include the reading of data into SAS, simple data transformations, recoding variables, labeling output, and performing simple univariate and bivariate analyses. **Prior knowledge of MUSIC/SP is required.**

Two separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Thursday, September 24: 1–3 p.m.
Instructor: Panu Sittiwong

Thursday, October 22: 6–8 p.m.
Instructor: Panu Sittiwong

5. Introduction to SPSS^X – SPSS^X is the latest version of this popular data analysis system originally developed for social scientific research. While SAS is slightly more powerful for the analysis of complex datasets, many users find SPSS^X to be easier to learn. SPSS^X also includes more flexible facilities for collapsing and labeling variables. This course is recommended for individuals who plan to incorporate statistical analyses into their research. Topics covered include the reading of data into SPSS^X, simple data transformations, recoding variables, labeling output, and performing simple univariate and bivariate analyses. **Prior knowledge of MUSIC/SP is required.**

Two separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Wednesday, September 23: 3–5 p.m.
Instructor: Rocky Ward

Monday, October 26: 6–8 p.m.
Instructor: Rocky Ward

6. File Handling with SAS, SPSS^X, and BMDP – Anyone who uses these common statistical packages frequently should be aware of procedures available to simplify reading and processing datasets. Variable formats, labels, and computed variable information can be stored in a dataset and recalled in a future job with one command. This course shows you how to use simple JCL along with the statistical software to make your jobs run much more quickly and smoothly. Familiarity with at least one of the packages mentioned is necessary.

Two separate two-hour sessions to be held in the Graphics Lab (ISB):

Wednesday, September, 30: 9-11 a.m.
Instructor: Scott Barber

Friday, October, 30: 1-3 p.m.
Instructor: Scott Barber

- 7. Introduction to SAS/GRAPH** – This course introduces those people who are familiar with CMS and have a valid CMS ID-code (see #8 below) to the use of the interactive graphics capabilities of SAS. **A working of knowledge of SAS is helpful in getting the full benefits from this class.**

Two separate two-hour sessions to be held in the Graphics Lab (ISB):

Wednesday, September 23: 1-3 p.m.
Instructor: Panu Sittiwong

Tuesday, October 27: 3-5 p.m.
Instructor: Panu Sittiwong

- 8. Introduction to CMS** – This course provides an introduction to the CMS interactive operating system available on the IBM compatible computer. **Only those faculty members and graduate students who have received prior approval from the Academic Computing Services Manager to have a CMS ID-code are eligible to take this course.**

Two separate two-hour sessions on using CMS to be held in the Graphics Lab (ISB):

Monday, September 21: 1-3 p.m.
Instructor: Philip Baczewski

Monday, October 26: 3-5 p.m.
Instructor: Philip Baczewski

- 9. Introduction to VAX/VMS, Part I** – VMS is the interactive operating system used on the Digital Equipment Corporation (DEC) VAXcluster. Nearly all popular programming languages are supported under VMS. The topics covered in this course include gaining access to the VAXcluster through the Local Area Network, logging in and out, changing your password, creating files and directories, creating login command files, using the EDT editor, and defining logicals and symbols.

Two three-hour sessions to be held in Room 110 of the Science Library (ISB).

Wednesday, September 23: 6-9 p.m.
Instructor: Ron Brashear

Thursday, October 22: 2-5 p.m.
Instructor: Ron Brashear

- 10. Introduction to VAX/VMS, Part II** – This course provides a more detailed examination of VMS commands and utilities. The topics covered in this course include use of the electronic mail and messaging systems, creating command files, advanced editing using TPU, and sending mail through BitNet. **Prior experience using VAX/VMS is required**

Two separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Thursday, September 29: 9-11 a.m.
Instructor: Ron Brashear

Wednesday, October 28: 1-3 p.m.
Instructor: Ron Brashear

- 11. Introduction to BITNET** – BITNET is a network linking more than 600 computers at over 300 institutions and research centers. This course covers the basic concepts of BitNet, file transfers across BitNet sites, and other services that are available on this computer network. Faculty and graduate students needing to exchange information with other universities and research institutions in the U.S., Canada, Europe, or Japan will benefit greatly from attending this course. **Prior knowledge of at least one of the following interactive operating systems is required: CMS, MUSIC, VAX.**

Two separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Monday, September 28: 9-11 a.m.
Instructor: Philip Baczewski

Wednesday, October 28: 3-5 p.m.
Instructor: Philip Baczewski

1987 Software Highlights

The following changes/additions to software have been made during the past year:

NAS/8083 (ACAD)

- BMDP – 1987 Version installed (January).
- PHOENIX – "Using PHOENIX Library" installed on PHOENIX Computer Based Training System (April).
- SPSS^X – Release 2.2 installed (April - became default release in August).
- PHOENIX – Updated to Release 6.0D (May)
- COM-LETE – updated to Version 4.3 (May).
- VTAM – updated to Version 2.1 (May).
- Waterloo/SCRIPT (OS/MVS) – updated to Version 86.1 (August)
- PLI (OS/MVS) – updated to Version 1.5.1 (August) - problems may result if trying to execute a non-standard PROC. Contact the Computing Center for more information (565-2324).
- MINITAB (MUSIC) – updated to Version 5.1 (August).

HP 2680A Laser Printer

- ALA, PN01, TN01, TNS1 print environments – modified (consult the April, 1987 *Benchmarks*, pp. 3-5 for a look at the modified environments).

- PNB1 print environment – installed (April). Simulates the "green bar" look of impact printer paper. Has the same characteristics as PN01.
- TNW1 print environment – installed (June). Provides "wide printing" (92 lines by 97 characters) using the TN character set.

VAXcluster

- UTILITY menu – changed from full-screen to line oriented to allow for faster processing time. It also accepts parameters (January).
- PRTMENU – updated to use JNET (March).
- UNREAD command – created to allow for monitoring of unread mail (March).

Microcomputers

- NTSUCOM.EXEC – updated for PCWS (January).
- PC-SIG Library of public domain MS-DOS software available (March).
- Procomm – upgraded to Version 2.4.2 (April). §

NTSU COMPUTING CENTER POLICY AND PROCEDURE HIGHLIGHTS

Modified version of an article that originally appeared in the August 1986 Issue of Benchmarks

- **PROCEDURE FOR OBTAINING USER ID-CODES FOR CLASSROOM INSTRUCTION** – When applying for ID-codes for classroom use, we ask that faculty fill out **two** forms for **each** class in which they need computer ID-codes. The first form, titled "Classroom ID Usage Projection" [white – F-020-03 (11/7/86)], fulfills two purposes. First, information on course enrollment, number of ID-codes, systems and software usage aids the Computing Center in planning for future computer and software purchases. Second, the form collects information on other special facilities provided by Academic Computing, such as terminal rooms, the Graphics Lab, and short courses, which the class may require.

The second form, which is blue, is called the "NTSU Computing Center User-ID Request Form [F-020-01 (04/15/87)]," and is used to assign all mainframe computer ID-codes at the University. The information on this form is entered into a computer database by our clerical staff. This database forms the input for a program which automatically assigns ID-codes and passwords on all of our computer systems. It is critical, therefore, that this form be filled out accurately and completely.

In addition to the faculty member's name and Social Security Number, there are several other important items on the blue Request Form. Instructors should indicate that they are requesting Classroom user IDs, and specify the course information with department, course and section. Failure to provide this information will slow down the processing procedures.

The form also contains a space to indicate the number of students in the class. If this area is left blank, our program will assign user ID-codes to all students registered for that class. Each ID-code will be matched with the name of a student in the class as contained in the University student records database. At the beginning of each new semester, therefore, it would be wise to wait until most add/drops have been completed before requesting computer user ID-codes for classes.

The ID-codes will be composed of two letters and two digits. The two digits will start with 00, then 01, 02, etc. until the number is equal to the number of students in the class. The ID-code numbered 00 is in the instructor's name (for the instructor's use only), and each of the other codes is assigned to a student by name. Slips containing the ID-codes, passwords and names should be picked up by the instructor at the Computing Center Reception Area, located in the Information Science Building, Room 119.

If additional students are added to the class, the instructor need only call Sharon, Fonda or Carolyn in the Computing Center, Ext. 2324, letting them know the last number in the original range assigned. The required number will then be added, and may be picked up shortly thereafter in the Computing Center. Likewise, instructors may cancel the ID-codes of students who drop the class by providing the student names and ID-codes in a written memo.

Under some circumstances, instructors may prefer that ID-codes not be assigned to each student by name. This may occur, for example, when students will be working only as teams, or when codes are needed before the class rolls are determined. Only in cases like these should instructors indicate the number of ID-codes required for the class. All these codes will be assigned in the instructor's name, and will range from 00 to the number requested. Once again, the 00 ID-code should only be used by the instructor.

Instructors should indicate on the Request Form the computers and operating systems required for the class. The MUSIC/SP system is required to access almost all software on the IBM-compatible mainframe NAS/8083 computer, including those programs that run only under the OS batch operating system.

Normally, then, classes that use the IBM-compatible system will require both MUSIC and OS batch ID-codes. Classes which use the VAX computers will also be assigned OS batch ID-codes, so that students may use the central printers in the ISB. *No class ID-codes will be assigned on the administrative portion of the NAS/8083 computer under any circumstances.* Classes which require access to the CMS operating system, or the COM-LETE teleprocessing monitor on the academic NAS/8083, must first have the approval of the Academic Computing Manager.

Faculty should also fill in the departmental account number and department name. This information allows us to collect data on computer usage by department and college which is useful in planning for future computer and software purchases.

The Request Form is not complete until it has been signed by both the faculty member and the department head. These signatures certify that the computing services requested are in support of NTSU activities, and will not be used for commercial purposes or personal financial gain.

• THE RESPONSIBILITIES OF COMPUTER USE –

Like most of life's other privileges, the privilege of being a computer user at NTSU brings with it some responsibilities. These responsibilities involve two common things: courtesy and sense. Every computer user must comply with the following statement, which is signed by individual ID-code holders and Instructors who apply for classroom ID-codes. It is the Instructor's responsibility to inform their students about this when they pass out the ID-codes.

I hereby certify that to the best of my knowledge and intent, the computing services obtained through the use of this request form will be for the purpose indicated above and:

1. Will be limited to justifiable computing support of NTSU/TCOM activities;
2. Will not be used for commercial purposes or financial gain.

I understand the unauthorized use of files or userids other than my own may be a violation of Texas State criminal law (see BENCHMARKS, Feb. 1986, pp. 2,3 for a more detailed description). Any unauthorized use of another user's program or data files will result in the loss of computing privileges and possible disciplinary or criminal action.

This means, among other things, that people who have classroom ID-codes, cannot use them for non-classroom work. There have been instances in the past of student violations with regard to the use of classroom ID-codes. These violations have included such things as using the computer to perform tasks in connection with an off-campus job, and using the laser printer to produce resumes. **BE FOREWARNED!** For a student, loss of computing privileges, *which could happen* when you do such things, could make it impossible to complete classroom assignments, or even an entire degree program. Furthermore, abuse of computing resources could result in the restriction of computing services for the entire academic community.

See related topic that follows . . .

• COMPUTER CRIME AND YOU: KNOW THE LAW –

The Texas State Legislature amended Title 7 of the Penal Code, effective September 1, 1985 to include computer crimes. After providing definitions for such terms as 'communications common carrier,' 'computer,' 'computer program,' 'computer security system,' 'data,' and 'electric utility,' Senate Bill 72 goes on to state:

"Section 33.02. BREACH OF COMPUTER SECURITY.

(a) A person commits an offense if the person:

- "(1) uses a computer without the effective consent of the owner of the computer or a person authorized to license access to the computer and the actor knows that

there exists a computer security system intended to prevent him from making that use of the computer; or

— "(2) gains access to data stored or maintained by a computer without the effective consent of the owner or licensee of the data and the actor knows that there exists a computer security system intended to prevent him from gaining access to that data.

"(b) A person commits an offense if the person intentionally or knowingly gives a password, identifying code, personal identification number, or other confidential information about a computer security system to another person without the effective consent of the person employing the computer security system to restrict the use of a computer or to restrict access to data stored or maintained by a computer.

"(c) An offense under this section is a Class A misdemeanor.

"Section 33.03. HARMFUL ACCESS.

(a) A person commits an offense if the person intentionally or knowingly:

— "(1) causes a computer to malfunction or interrupts the operation of a computer without the effective consent of the owner of the computer or a person authorized to license access to the computer; or

— "(2) alters, damages, or destroys data or a computer program stored, maintained, or produced by a computer, without the effective consent of the owner or licensee of the data or computer program.

"(b) An offense under this section is:

— "(1) a Class B misdemeanor if the conduct did not cause any loss or damage or if the value of the loss or damage caused by the conduct is less than \$200;

— "(2) a Class A misdemeanor if the value of the loss or damage caused by the conduct is \$200 or more but less than \$2,500; or

— "(3) a felony of the third degree if the value of the loss or damage caused by the conduct is \$2,500 or more.

"Section 33.04. DEFENSES. It is an affirmative defense to prosecution under Sections 33.02 and 33.03 of this code that the actor was an officer, employee, or agent of a communications common carrier or electric utility and committed the proscribed act or acts in the course of employment while engaged in an activity that is a necessary incident to the rendition of service or to the protection of the rights or property of the communications common carrier or electric utility.

If you are interested in seeing the text of the entire document, contact Claudia Lynch, Benchmarks Editor at 565-2324, or send electronic mail on either the VAX, MUSIC/SP, or CMS to the ID-code AS04.

• **CONSULTING ON PIRATED SOFTWARE** – It is the policy of the Computing Center that no consulting will be done with users on microcomputer software that we know or have reason to believe is pirated. "Pirated" means that the software is being used in violation of the license agreement with the company that produced the software. So ... if you copy someone else's software and can't run it on your micro, don't come to us.

• **AFTER-HOURS OUTPUT RETRIEVAL FOR STUDENTS IN WHEELCHAIRS** – The following procedure is to assist students in wheelchairs to obtain output printed on the Laser or Remote 3 printers after regular office hours.

During regular office hours (8 am - 5 pm, Monday through Friday), students in wheelchairs may enter through the Computing Center front office (Rm 119 ISB) and go

through the hallway around to the Output boxes to retrieve their output.

After 5 pm on weekdays and at all times on weekends, this office is closed. At these times, follow the steps below.

1. ON MUSIC using REMOTE 3:

Jobs routed to this Remote have been printed when OSJR responds "JOB NOT FOUND". Proceed to '3' below.

2. ON MUSIC using LASER:

Wait about 45 minutes after OSJR responds "JOB NOT FOUND", then call 3890 to see if your job has printed.

ON VAX using LASER:

Wait about 50 minutes after submitting your job with the LASER command, then call the Output Operator at 3890 to see if your job has printed.

3. When your job has printed, tell the Output Operator (at 3890)

- A. Your name,
- B. How many jobs you'll be picking up,
- C. Filing type specified on the output,
- D. That you're on your way over to pick up the output.

4. Come over to the ISB main entrance. Buzz the key-operated buzzer by the far right door, and come into the hallway by the door to ISB room 119.

The Output Operator on duty will have retrieved your printouts after your phone call. (S)he will listen for the buzzer as a signal to bring the printouts to you at the door of rm. 119, as soon as he is able to do so.

TO OBTAIN A KEY TO THE BUZZER: See Handicapped Student Services, in the Dean of Students Office.

- **JOB PROCESSING POLICY REMINDER** – Every semester brings with it new faculty and students and returning faculty and students who have had plenty of things to think about between semesters besides what the Computing Center job processing policies are. It is for this reason that it is probably a good idea to review some of the "biggies," as far as rules go ...

1) One of the most important rules is the 4 COPY RULE. That is, the maximum number of copies of a job to be printed on any Computing Center printer is 4. Exceptions to this policy must be approved by the Associate Vice President for Computing or his authorized representative. VIOLATIONS WILL BE REPORTED TO THE APPROPRIATE VICE PRESIDENT. This rule should be taken very seriously.

2) No more than 5 jobs can be submitted to the execution queue by the same person at one time. Additional jobs will be canceled unless special permission has

been obtained and Computer Operations has been notified. Permission may be gained by contacting Academic Computing Services (ISB 119, 8-5 M-F).

3) Jobs can have different classes, and if you misclassify your job it may be canceled. Following is the job class schedule.

CLASS:	TIME/LINES RESTRICTIONS:	# OF TAPES:
A	3*TIME + (LINES/1000) <= 45	NONE
B	3*TIME + (LINES/1000) <= 45	ONE
C	3*TIME + (LINES/1000) <= 45	THREE
D	3*TIME + (LINES/1000) <= 45	TWO
J,K,N	3*TIME + (LINES/1000) > 45	< THREE
M	3*TIME + (LINES/1000) > 45	THREE

BATCH CLASSES (TIME + LINES <= 4) (NO TAPES):

CLASS: COMPILER:

1	PLC
2	WATFIV
3	SPITBOL
4	WATBOL
5	WATFIV-S

Class L is reserved for JOBS requiring over two megabytes (2048K). Permission to run such jobs must be obtained from Academic Computing Services (ISB 119, 8-5 M-F).

NOTE: Class J,K,L,M, or N jobs must have a special handling notice submitted to the operators via 'SURF' stating time, lines, and number of devices (tapes) required before the jobs will be processed. Enter **HELP SURF** while in *GO mode on MUSIC for more information.

More information about Computing Center JOB processing policies can be obtained by entering **HELP OPER** from *GO mode on MUSIC.

- **OS DATASET NAMING CONVENTION** – The naming convention for OS disk and tape datasets on the ACADemic NAS/8083 CPU is: *USER.myid.filename*

where: *USER.* – must appear
myid – is your User-ID and must appear
filename – must appear
– is one or more optional fields (each of which may not exceed 8 characters) separated by periods.

If you are allocating a VSAM dataset, you should use the high-level qualifier of **USRV.** instead of **USER.** If a job attempts to create or access a dataset that does not have a proper high-level qualifier, the job will fail with a JCL error, and the following message will appear in the system messages area of your output:

IEF720I jobname ddname – USER NOT AUTHORIZED TO DEFINE THIS DATA SET

Tape datasets should also follow the above naming convention. Catalogued datasets will be deleted if they do not follow the proper convention.

- **FILE MANAGEMENT POLICY FOR OS/MVS DISKS** – The following procedures are in effect for managing files on the academic disk packs.

ACAD01

The end of every semester is celebrated by the volume ACAD01 being reformatted. This means that all data and programs stored on this disk will be destroyed. Those of you who have data or programs stored on this disk that you wish to keep beyond the end of the semester should copy them onto tape. You can then restore your files to the disk at the beginning of the next semester.

The volume ACAD01 is to be used solely for instruction by faculty and students in the College of Business. College of Business faculty and graduate students who have data and programs used for research should copy their files to ACAD00. Faculty and students from other colleges should remove their files from ACAD01 as soon as possible, should they accidentally allocate files to that volume. The procedure we use to reformat the disk volume will allow no exceptions. All files on the disk will be destroyed.

ACAD00 AND ACAD02

All files on the volumes ACAD00 and ACAD02 which have not been accessed for the previous 365 days are deleted at the end of every long semester and before each Fall semester. Users who have data and programs on these volumes that are infrequently accessed should copy these files to tape.

A UTILITY PROGRAM TO MOVE DATA SETS

You may use the utility program MOVEDATA to move a sequential or partitioned dataset from OS disk to tape, or from one OS disk to another. To access this program, type MENU in the *GO mode on MUSIC. Users with VSAM or ISAM data sets are responsible for writing the appropriate programs to move their files.

- **PROCESSING TAPES ON THE NAS/8083** – Tape processing on the NAS/8083 is accomplished through a tape management system (TMS), which provides users with protection against inadvertent loss of tape data and manages the many tapes in the Computing Center's tape library. In order for the TMS to be effective, it must control all the tapes that are being processed. To accomplish this, people who own tapes that they want to access must have them copied onto a tape controlled by the TMS. The only exception to this rule is if you want to access a foreign tape (a tape that doesn't belong to the TMS) "just one time." This might be the case if you want to copy files from a tape onto disk. In all other cases, you cannot access data contained on a tape unless it resides on a TMS volume. The OPER help file on MUSIC has a good overview of the Tape Management System here at NTSU. To read it, enter **HELP OPER** while logged-onto MUSIC and follow the instructions.

Below are some procedures to follow to process tapes on the NAS/8083:

CONDITION

Copy Tape onto TMS

ACTION

Bring tape and any documentation about it to the Computing Center Reception Area (ISB 119). Fill out the BLUE form for copying Foreign tapes onto the TMS. Deliver the form to the Computing Center Reception Area (ISB 119).

Copy TMS volume to personal tape

Find out what the requirements are for tapes at the location you are planning to process your tape, if this is the reason you are copying the TMS volume. Bring your personal tape to the Computing Center Reception Area (ISB 119). Blank tapes may be purchased here, also. Fill out the GREEN form for copying TMS volumes onto Foreign Tapes.

Copy files from personal tape to disk

Bring your tape to the Computing Center high security area (GAB 5th floor - take the northeast staircase). Run your job (remembering to send a SURF message telling the operator to process your tape - enter SURF on MUSIC and follow the instructions). When you are through, and are sure your job worked, return to the high security area to pick up tape.

NOTE: If you have a non-labeled tape and don't want to write dataset names, the Tape Librarian will assume it is O.K. with you to name your files FILE001 to FILE00N. Since the same dataset naming convention exists for tape datasets as does for disk datasets, this is generally not such a good idea.

The tape management system keeps track of what is going on with its tapes through the tape management catalog (TMC). The TMC is updated each time a tape is mounted and dismounted, and contains the following information:

-Volume Serial	- Record Format
-Blocksize	- Expiration Date
-Tape Density	- Dataset Name
-Logical Record Length	-Jobname/Stepname Creating File

The TMS allows users to specify retention periods and expiration dates for their tapes (expiration dates are calculated, if a retention period is specified). The default retention period is 180 days. Each file on a tape has an expiration date associated with it. If the tape is a copy of an outside (foreign) tape, all the datasets (files) on the tape will have the same expiration date. If the tape consists of files that have been added over time, each file will have a different expiration date. **A TAPE WILL NOT EXPIRE, UNTIL ALL THE FILES ON IT HAVE EXPIRED!**

While this may be a comforting thought, do not be lulled into blissful abandon. Unless you are continually adding files to your tape, it will expire eventually, and then what will you do? An expired tape is AUTOMATICALLY returned to scratch tape status, ready to be written over at a moments notice. To keep on top of things, occasionally (once every couple of months or so), run the following job:

```
//JOB CARD < _____ A Valid job card
// EXEC TMSINFO
//SYSIN DD *
VOL=tapevolume < _____ Your TMS tape number
/*
```

This will inform you of the status of the various files on your tape(s). It should be noted that the expiration dates (EXPDT=) reported by this utility are specified as Julian Dates. The table provided below should aid you in deciphering the expiration date(s) of your file(s).

Should the need arise, the TMC can be updated online or through batch by authorized personnel. If, for example, you wanted to change the expiration date of a tape, this could be accomplished by an update to the TMC. To request an update of the TMC, submit a TMS Update Form (available from the Computing Center, ISB 119) to a member of the Academic Computing staff. The staff member will assist you in completing the TMS Update Form and will make arrangements with the Computer Operations Tape Librarian to process the TMS update request. Run the TMSINFO Utility (shown above) three days after submission of the form to verify that the update has taken place.

For more information on the Tape Management System, type **HELP OPER** while in *GO mode on MUSIC and follow the instructions.

Perpetual Julian Date Calendar (Non Leap Year*)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	001	032	060	091	121	152	182	213	244	274	305	335
2	002	033	061	092	122	153	183	214	245	275	306	336
3	003	034	062	093	123	154	184	215	246	276	307	337
4	004	035	063	094	124	155	185	216	247	277	308	338
5	005	036	064	095	125	156	186	217	248	278	309	339
6	006	037	065	096	126	157	187	218	249	279	310	340
7	007	038	066	097	127	158	188	219	250	280	311	341
8	008	039	067	098	128	159	189	220	251	281	312	342
9	009	040	068	099	129	160	190	221	252	282	313	343
10	010	041	069	100	130	161	191	222	253	283	314	344
11	011	042	070	101	131	162	192	223	254	284	315	345
12	012	043	071	102	132	163	193	224	255	285	316	346
13	013	044	072	103	133	164	194	225	256	286	317	347
14	014	045	073	104	134	165	195	226	257	287	318	348
15	015	046	074	105	135	166	196	227	258	288	319	349
16	016	047	075	106	136	167	197	228	259	289	320	350
17	017	048	076	107	137	168	198	229	260	290	321	351
18	018	049	077	108	138	169	199	230	261	291	322	352
19	019	050	078	109	139	170	200	231	262	292	323	353
20	020	051	079	110	140	171	201	232	263	293	324	354
21	021	052	080	111	141	172	202	233	264	294	325	355
22	022	053	081	112	142	173	203	234	265	295	326	356
23	023	054	082	113	143	174	204	235	266	296	327	357
24	024	055	083	114	144	175	205	236	267	297	328	358
25	025	056	084	115	145	176	206	237	268	298	329	359
26	026	057	085	116	146	177	207	238	269	299	330	360
27	027	058	086	117	147	178	208	239	270	300	331	361
28	028	059	087	118	148	179	209	240	271	301	332	362
29	029		088	119	149	180	210	241	272	302	333	363
30	030		089	120	150		211	242	273	303	334	364
31	031		090	151			212	243	274	304	335	365

*For leap years (1988, 1992, 1996, etc.) add a day on February -060 -thus incrementing all the following dates by one.

•TURNAROUND ON THE LASER PRINTER –

The Hewlett-Packard 2680A Laser Printer provides high quality computer-generated output with the flexibility of different character styles (fonts) and various character per inch settings. This printer serves users from the NAS/8083 the VAXcluster. The Laser prints an average of over 5.5 million lines printed each week – more than ten times as much as any other Computing Center printers.

The HP-3000 system through which the Laser printer is accessed serves all users on a first-come, first-served basis. All jobs routed to the Laser go through the steps described below:

When you route a print job to 'REMOTE 4' or 'LASER' using MUSIC, the VAX, COM-LETE, or CMS, your job is placed on an output queue for Remote 4. At this point a MUSIC user in OSJR would receive information similar to the following:

JOB 299 ID32PRT OUTPUT READY - ROUTE 4 200 LINES

When your job is next in line to print, it is sent down a communications line from the mainframe to the HP 3000 system. Each half of the NAS/8083 has a communications line to the HP, so jobs spool to this system simultaneously from the ACAD and ADMN portions of the NAS/8083.

After a print job has been sent to the HP-3000 system via this communications line, the mainframe no longer has any record of the job. At this point, a MUSIC user would receive "JOB NOT FOUND" when querying OSJR for the status of his job. Keep in mind that at this point the job has NOT printed – it will be from 45 minutes up to several hours before it prints, depending on the volume and length of jobs already transferred to the HP-3000 system.

When your job is transferred to the HP-3000 it is placed on an output queue for the Laser printer. Jobs from both mainframes are placed on this queue in the order received – neither system has "priority". When your print job is first in line on this HP system queue, will be printed on the Laser.

The apparent delay for users of the Laser printer is caused by the number of jobs waiting to print on the HP system. Since this system receives output from multiple Host computers (the NAS/8083 and VAXcluster), it runs almost constantly during the day and night printing output as it is received. For a MUSIC user, a job may spool over to the HP system in five minutes or less. However, once transferred to the HP this job may be 125th in line, which means it will be at least an hour or more before it prints, depending on the size of the jobs preceding it.

To avoid waste of computer resources and needless increase of turnaround on the Laser, use the Laser printer only when you really need it – otherwise:

Route output to REMOTE1 (BA) or REMOTE3 (ISB) if a Laser print font is not necessarily needed, and for "test runs" of class projects. (Turnaround is usually QUICKER at these remotes, also).

Thoroughly proof read and test jobs before requesting copies.

Abide by the limit of 4 copies printed by any method. Use copy machines or the Copy Centers for further copies.

Allow enough waiting time before you go to the ISB to retrieve your Laser output – 45 minutes at the least. Toward the end of the semester (last 4-5 weeks) it usually takes several hours.

Check the "LASER PRINTER STATUS" board kept in the ISB Output window for a current estimate of Laser turnaround time. §

COMPUTING AT TCOM

By Mansur Hasib, TCOM Academic Computing Coordinator (AC36@NTSUVAX)

Committee formation and reformation was an important aspect of the many accomplishments made at TCOM this summer with regard to computing. Of particular significance was the creation of a TCOM Computing Steering Committee which was appointed to oversee the planning and management of computing. Members of this group include the following: Vice President for Academic Affairs and Dean, Vice President for Fiscal and Administrative Affairs, Associate Vice President for Computing (NTSU), Associate Vice President for Fiscal Affairs, Associate Dean for Medical Education, and Chairman of the Computing Council.

The TCOM Computing Council was reorganized to include the following: Associate Vice President for Fiscal Affairs, Associate Dean for Medical Education, Telecommunications and Operations Coordinator, Fiscal and Administrative Computing Coordinator, Director of Evaluation and Information Systems, Research and Instructional Computing Coordinator, Health Science Library Systems Librarian, two Basic Science faculty and two Clinical Science faculty.

The big news for WordPerfect and PlanPerfect users is that service on the TCOM Token Ring Network has been expanded. This was accomplished with the installation of Network WordPerfect for word processing and Network PlanPerfect for spreadsheet analysis. There are no limits to the number of simultaneous users who can use the programs on the network!

A final item of general interest with regard to computing is that IBM has been assisting TCOM in conducting an "Application Transfer Study." This study aims to understand how information is processed at the college level. A college-wide survey along with a series of interviews was conducted to provide data for the study. §

Using #EXCHANGE to Help Manage Your MUSIC Save-library Space

By Philip Baczewski, MUSIC/SP Timeshare Coordinator (AC12@NTSMUSIC)

It may be one of Murphy's laws that the amount of stuff one has always increases to fill the amount of space one has. At times, this seems particularly true on MUSIC. I'm sure many people have thought, "Well, I really don't use that file much any more, but I really should keep it...." In many cases, the file can simply be purged with no later remorse, but sometimes, there is the need both to keep a copy of the file and to free up some MUSIC library space. The good news is that MUSIC users can take advantage of the storage available under control of the MVS operating system through use of the #EXCHANGE utility program.

The first issue we need to address is accessing other forms of storage from MUSIC. Most MUSIC users are aware that they can submit jobs to the MVS/SP operating system for batch processing. MUSIC users can also use storage media under the control of MVS/SP: magnetic tape storage and Direct Access Storage Devices (DASDs or as they are more commonly known - MVS disk volumes). These devices offer the MUSIC user the opportunity to store a copy of a MUSIC file on tape or on an MVS disk, where storage space is more readily available.

The #EXCHANGE utility program is designed to help MUSIC users archive (dump) their MUSIC SAVE LIBRARY files to MVS disks or to tape, later restore the files with minimum effort, and free the space quota assigned to their MUSIC IDCODS for more frequently used programs and files. To start this program, you can type #EXCHANGE from MUSIC command (*GO) mode. You will then be asked a series of questions which need to be answered very carefully. The answers you supply are the information #EXCHANGE needs to write your file to the appropriate tape or MVS disk. Check-points are built into the utility program to make sure that your responses are valid, but you must be sure to supply the correct information for items such as filename, disk volume, tape volume, etc.

Before you start using disk or tape storage on MVS, it may be helpful to know some of the terms and concepts associated with these storage media. If you have submitted jobs to MVS before, you may recognize some of these from your JCL.

- **LRECL** – Logical RECORD Length – the number of bytes (characters) in each record. When you use #EXCHANGE, the logical record length (LRECL) of your files should not exceed 80 characters.
- **RECFM** – RECORD ForMat – MVS allows several different record formats for data storage. The format you will probably use the most is FB (Fixed Blocked) where logical records are grouped in blocks for more efficient input/output and storage.
- **BLKSIZE** – BLock SIZE – the number of records in each block. For efficiency, use a factor of 20 or above

(BLKSIZE must be a multiple of LRECL so if LRECL = 80 and the blocking factor is 20, then BLKSIZE = 1600).

The #EXCHANGE program will ask you to give values for the above parameters. Your response can be a semicolon ';' which indicates the following defaults:

LRECL = 80 BLKSIZE = 6160 RECFM = 'FB';

In most cases, the above values will be correct for writing MUSIC files to disk or tape.

- **VOLUME** – Each MVS disk has an associated volume name. The Volumes you will be using are ACAD00, ACAD01 or ACAD02. Tapes usually have an associated volume name or number also.

Note that ACAD00 is reserved for data sets (files) related to faculty research. ACAD01 should be used for data sets created by or for students of the College of Business. All other data sets may be saved on ACAD02.

- **DATA SET NAME** – Each file you save on a disk or tape volume has its own associated name. Data set names used with the MVS operating system at NTSU must conform to a special naming convention as follows:

USER.myid.filename

Where USER. must appear and:

myid. = is your User-ID and a period (.) – must appear.
filename = A user-selected name for the file, every 8 characters separated by a period, with a maximum of 34 characters (including periods).

If you are using a TMS tape, the data set must follow the above convention with the exception that filename portion may only be a maximum of 7 characters long.

- **DATA SET SEQUENCE NUMBER** – Data sets on tape are stored equentially (in other words, one after another) so, to make sure the correct data set is being specified, you must tell MVS what the sequence number of that data set is. For example, the first data set has sequence number 1, the second data set has sequence number 2, etc.
- **LABEL** – When using tape storage, data can be written along with descriptive information (name, LRECL, BLKSIZE, etc.) in records at the beginning and end of the file. These extra records are called labels and tapes written in this manner are usually referred to as Standard Labelled (abbreviated SL). All NTSU Computing Center tape-library tapes under control of the Tape Management System (TMS) have IBM standard labels. Tapes without these extra records are called Non-Labelled (NL).
- **DENSITY** – Tape information can be written at three different "densities": 6250 BPI (Bits Per Inch), 1600 BPI, and 800 BPI. All TMS tape-library tapes should be written at 6250 BPI.

For more information on the Tape Management System (TMS) and tape handling, type **HELP OPER** when in command mode (*GO) and choose topic 8. For more information about using disk data sets, choose topic 10 of **HELP OPER**.

As mentioned, the #EXCHANGE program will prompt you for the information described above. Dumping Save Library files will not destroy your original file in MUSIC. Also the reverse situation, retrieving files from OS/MVS will not destroy your original file on OS/MVS disk or tape, however, #EXCHANGE does provide for deleting disk data sets should you not need them any more. After you have made sure that your MUSIC SAVE LIBRARY file is correctly saved on OS/MVS disk or on tape it is your responsibility to purge that file from your MUSIC library to free the space for future use.

If you want to archive files and you would like to keep a record of the files written to tape or disk, before your first time executing #EXCHANGE create an empty file by using the EDIT command (type HELP EDIT from *GO mode for more information). When #EXCHANGE is executing, enter the name of the empty file in response to the prompt for the name of your directory. #EXCHANGE will log to your directory the data set name, logical record length, blocksize, and record format of the file, volume serial number to which the file was saved, the sequence number and the tape density (if tape is used), and time and creation date of the file. The directory needs to be created only once. Each time it is used, new information is appended to the end of the directory. However, if you delete any files which you had already saved on an OS/MVS disk volume using #EXCHANGE, it is up to you to remove the log entry of the deleted file from the directory (if a directory had been used at the time of the file's creation).

You can find more information about using #EXCHANGE by typing HELP #EXCHANGE from MUSIC *GO mode. If you have any additional questions please call the Help Desk at 565-4050 or the Computing Center (565-2324), or send a message to 'SYSTEM' while logged on to MUSIC (for information on sending messages, type HELP MEMO from *GO mode). §

Repeated Measures Analysis in SPSS^X

By Scott Barber, Academic Computing Consultant
(AC10@NTSMUSIC)

In a recent article (*Benchmarks*, April, 1987), I discussed the use of the MANOVA procedure with SPSS^X to explore the relationships among multiple dependent variables. This time, we will look at a more specialized case of MANOVA, in which there are multiple measurements of a construct for each subject or respondent.

When to conduct repeated measures analysis

In order for repeated measures to be appropriate, the researcher should have measurements of a construct which are over time or under different circumstances or treatments, such as multiple measures of heart rate after various physical exercises, or some type of performance tests measured after differing training sessions.

They can also involve different measures of an underlying construct (such as different measures of well-being) measured at the same time. The key is that the various de-

pendent measures must be "qualitatively" similar, or else there is no reason to do the multivariate analysis in the first place.

Determining the relevance of a repeated measures design also involves the idea of having hypotheses concerning the levels of the repeated or "within-subjects" factor(s). If there are no within-subjects hypotheses, then a standard MANOVA will suffice.

Essentially, a repeated measures MANOVA is a regular MANOVA on transformed linear combinations of the variables defining the repeated measures factor.

What happens...

The SPSS^X ANALYSIS(REPEATED) command can automatically generate an "orthonormalized" transformation matrix, causing the analysis to be performed on the transformed variables. The benefit of having this matrix be orthonormal is that all of the univariate tests will be independent. Alternatively, you can also disregard the ANALYSIS(REPEATED) command and define your own transformations, but you must proceed with caution, because the univariate tests are not then protected against multiple comparisons.

Regardless of the type of transformation used, you always end up with one less transformed variable than original variables. One of these will represent the null hypothesis that the means of all the dependent variables are equal (across the between subjects factors, if there are any). The others combine to produce the multivariate tests of the "within-subjects" factor(s).

Advantages of repeated measure analysis

There are two major advantages to using a multivariate repeated measures test. The first is the ability to deal with fundamentally repeated measures data without making the rather restrictive assumption that the covariance matrix of the dependent variables follows a 'Type-H' pattern. (This has also been referred to as 'circularity,' and 'uniform-ness,' and is called 'sphericity' by SPSS.) On the other hand, the multivariate tests assume that when there are two or more groups (between-subjects factors), the variance-covariance matrices from each group are homogenous.

If you are interested in examining univariate differences, then the sphericity assumption comes into play again (see *Benchmarks*, April, 1987 for tests of this assumption), but refers to the transformed variables rather than the originals. The transformed variables must also have homogeneous covariance matrices across groups. Otherwise, the univariate F ratios will be too liberal. (If the sphericity assumption is not met, there are adjustments which can be made to the degrees of freedom to result in a more realistic univariate F statistic.)

The second major advantage of the multivariate repeated measures approach is that there is a built in control for individual differences which can increase the power of the multivariate test. While dropping the sphericity assumption (and doing a multivariate test as opposed to a univariate one) will generally lead to a loss of power, reduction of error varian-

due to individual differences helps to focus statistical attention on the hypothesized affects.

Using the SPSS^X MANOVA procedure

As mentioned earlier, repeated measures can be specified in SPSS^X by using the ANALYSIS(REPEATED) subcommand (along with the WSFACTOR and WSDSIGN subcommands) within MANOVA. These subcommands produce orthonormal transformations of the dependent variables corresponding to the within-subjects hypotheses. (See Section 28.74, p. 534 in the SPSS^X User's Guide, 2nd Edition for an example of the basic setup for a repeated measures analysis.)

To specify alternative transformations to test specific hypotheses concerning the within-subjects factors(s), use the CONTRAST subcommand. For example, you can easily specify POLYNOMIAL (linear, quadratic, cubic, etc.), REPEATED (adjacent levels), DEVIATION (each original variable vs. the grand mean), and several other types of contrasts.

If the transformation matrix is orthonormal, then the univariate tests will be independent and the averaged F test will be valid. SPSS^X will orthonormalize such contrasts as SIMPLE, DIFFERENCE and DEVIATION before the analysis, so you usually don't have to worry about it. However, be careful if you are constructing SPECIAL contrasts, such as for a profile analysis because there is no protection from multiple comparisons from an inflated alpha level.

One of the tricky aspects of reading the output from the SPSS^X repeated measures MANOVA is the identification of effects. The multivariate tests are easy enough to identify, but the univariate tests will be labeled according to the original variable names. However, these tests now correspond to transformed variables. Therefore, examination of the transformation matrix (with the PRINT TRANSFORM subcommand) will help you identify the labels associated with the univariate tests.

Final comments

In many cases, the actual statistical tests of the univariate and multivariate approaches will be the same. Use of the multivariate and/or univariate tests depend most heavily on the hypotheses of interest and the assumptions involved. Care in interpreting the results is essential with both of these procedures. Be aware that violation of the assumption of multivariate normality results in an inflation significance level of the multivariate tests.

On the other hand, violation of the sphericity assumption with two or more groups can result in "vastly distorted" significance levels of univariate tests. To make matters worse, the test for sphericity has been reported to be very sensitive to violations of multivariate normality!

The issue of the power of the two tests is not completely straightforward, either. If the assumptions of the univariate tests are met, they will often result in a stronger test, but in certain situations (such as single group designs), the mul-

tivariate test will discern effects which would not show up with the univariate tests, because they average to zero over subjects.

Therefore, use of the HOMOGENEITY tests along with plots to test for normality should be a standard practice to justify the use of these tests, and sphericity tests such as that proposed by Bartlett and the max F criterion should be examined before proceeding with interpretation of univariate and multivariate results. Although they are not foolproof, they will help provide some protection against making potentially misleading conclusions.

For further detail on repeated measures analysis consult:

Barcikowski, R. S. [ed.] (1983) *Computer Packages and Research Design with Annotations of Input and Output from the BMDP, SAS, SPSS, and SPSS^X Statistical Packages*. Washington, DC: University Press of America

Cole, J.W.L. and James E. Grizzle. "Applications of Multivariate Analysis of Variance to Repeated Measurements Experiments," *Biometrics*,

SPSS^X User's Guide, 2nd ed. (1986). SPSS, Inc. McGraw-Hill

Norusis, Marija. (1985) *SPSS^X Advanced Statistics Guide*. Chicago, IL: McGraw-Hill §

NTSU Faculty, Staff Members Attend ICPSR Summer Session

Two people from NTSU attended one-week workshops during the month of July at the University of Michigan. Their attendance was in response to the April announcement of "The ICPSR Summer Program in Quantitative Methods of Social Research."

Alan Moore, a faculty member in Educational Foundations, attended the one-week workshop on LISREL models. Scott Barber, an Academic Computing staff member, went to two one-week workshops including the same LISREL workshop and another on Logit and Log-linear models. Ken Bollen (Sociology, The University of North Carolina at Chapel Hill) taught the LISREL course, and John Fox (Sociology, York University in Toronto) taught the Log-linear workshop.

Attendees in the Log-linear and LISREL workshops represented a diverse range of departments and institutions. In addition to sociologists and political scientists, there were faculty from marketing, social work, history, biostatistics, behavioral science, organizational behavior, occupational health, economics, and criminal justice departments. ICPSR students represented faculty and staff in academic institutions and government agencies from Massachusetts to Hawaii, Canada, and Germany.

Reports of these workshops suggest a high quality of instruction in a productive and pleasant environment. As a member of ICPSR through NTSU, you are encouraged to consider attendance at next year's Summer Session. It is an excellent way for us to improve the quality of social research and methodological instruction at NTSU, and a good way to meet others with similar interests. §

BENCHMARKS Forum

BENCHMARKS Forum is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the *Benchmarks* editor (AS04@NTSMUSIC) or write it down and drop it by the Computing Center. Deadlines permitting, we will try to answer it in the next issue.

Question: *I have been using WordStar for several years to type manuscripts, but I've noticed that many of my colleagues are now using WordPerfect. What advantages does WordPerfect have when compared to WordStar?*

Answer: The answer to this question depends somewhat on the version of WordStar you are currently using. Most users are still working with version 3.3 of WordStar. If this is the version you are using, WordPerfect offers several features you may find useful. Among these features are table-of-contents and index generation, automatic footnoting, multiple-column editing, multiple document editing, a superb built-in thesaurus and spelling checker, sorting capabilities, math capabilities, a printer queue, support for DOS subdirectories, and extensive on-line help. WordPerfect also includes a program to convert existing WordStar documents to WordPerfect format. It should be noted that some of the deficiencies found in WordStar version 3.3 have been corrected in version 4.0. As a final note, WordPerfect is available for university use at a cost of \$125. Look for a more extensive comparison of these two products in an upcoming issue of *Benchmarks*.

Question: *Sometimes when I try to log into MUSIC by calling 3270 on the Local Area Network, I get a message: UNABLE TO OPEN SESSION - REMOTE PORT(S) BUSY. Other times, I get a message: UNABLE TO OPEN SESSION - NO RESPONSE FROM UNIT. What do these messages mean?*

Answer: In order to understand the meanings of these messages, you must first understand how the Sytek LAN modem ports are organized on the host (mainframe) end of the connection. Currently, there are 64 ports available on the host end that connect to protocol converters which allow ASCII terminals to appear to the minframe system as if they were IBM 3270-type terminals. The addresses for these ports are organized with a hexadecimal numbering scheme from 3270 to 328F with 2 ports per address (i.e. 3270,0/3270,1). When you place a call to 3270, the Sytek LAN looks for the first available port starting with 3270,0 and proceeding through 328F,1, a process we refer to as rotoring to the next available port. If all 64 ports are in use, you will see the REMOTE PORT(S) BUSY message. Occasionally, one of the 32 cards will fail, leaving a gap in the rotor. If this happens, and all of the ports prior to the failed card are being used, you will also see the REMOTE PORT(S) BUSY message. If you get this message, you should try to call a higher rotor address (i.e. 327D or 3285), and you may be able to connect to an available port.

The second message, NO RESPONSE FROM UNIT, can be caused by several problems. First, it is possible that the port

you are calling (i.e. 3270) has failed, in which case the LAN has no busy card to rotor past. In this case, you might try calling a higher address, such as 3280. It is also possible that the modem from which you are calling or the entire LAN has failed. To determine if this is the case, try placing a call to another host (i.e. 8040 or DEC). If these calls also result in a NO RESPONSE FROM UNIT message, you should report the problem to the help desk.

The data communications group attempts to monitor all host ports on a fairly regular basis. However, when they are busy solving other problems, it is often several hours before they discover a host port problem. Therefore, if you experience problems, don't hesitate to call the help desk for assistance. They will pass the word on to appropriate Computing Center personnel.

Question: *I have an IBM PC clone which I use to sign on to MUSIC. I can download files to my PC by using the capture feature of my communications software, but to do this, I have to log off the 3270 and sign on to 8040, download my output, then log off and sign back on 3270 to edit. (When I try capturing the file from 3270 it keeps giving me the "MORE..." message and I also end up with garbage in the file.) Is there any way I can download files and use full-screen editing without switching back and forth all the time?*

Answer: When you use 3270, you are connecting to a protocol converter which takes the input from your terminal (or microcomputer emulating a terminal) and converts it to a format which simulates IBM 3270-type full-screen input and output. Because the protocol converter is sending control characters to your terminal to update the screen, etc., this is not the best mode to do file transfer, because you will usually get extraneous characters in your file.

If you have an IBM PC or clone, you could take advantage of a PC program called PCWS (PC Work Station) which is available to NTSU MUSIC users at no charge (just bring a formatted diskette to the Computing Center to receive a copy.) PCWS uses the 8040 lines and performs the full-screen terminal emulation on the PC side. This allows you to take advantage of file transfer available from 8040 and still have full screen editing (with the PC Function keys used as the MUSIC PF keys.)

Question: *I would like to have 2 megabytes of virtual memory on my CMS ID. I want to use the SAS/PC to SAS/CMS linkup, and the April, 1987 issue of BENCHMARKS says that 2mb of memory are required. Is it possible for me to increase the virtual memory?*

Answer: You can increase the virtual memory on your CMS ID by entering the following commands when you first log on to your CMS account:

```
DEF STOR 2M <RETURN>
```

```
IPL CMS <RETURN>
```

You can then check your amount of virtual storage by typing: **Q STOR <RETURN>**

Once you have performed the previous steps, the storage parameter will remain set at 2 megabytes until you issue the LOGOFF command. \$

MICROCOMPUTERS

Office Automation News

By Sandy Franklin, Office Automation Specialist

Office Automation Status Report (May - August 1987)

The following classes were taught to interested faculty and staff members in the Computer Training Lab and Information Center located in Marquis Hall, Room 105, during May-August, 1987.

- Introduction to WordStar - 2 classes.
- Advanced WordStar - 1 class.
- Wordstar Mailmerge - 1 class.
- Introduction to WordPerfect - 8 classes
- SIMS Training - 7 classes
- Introduction to Lotus Spreadsheet - 5 classes
- Lotus Database/Graphics - 4 classes
- Introduction to Microcomputers and DOS - 1 class.

New Courses

Three new courses were introduced during July and were all heavily attended:

- The first course was "WordPerfect Advanced Applications for Manuscripts." It was given three times the week of July 14. Eleven staff members and eight faculty members attended this course.
- The second course was "WordPerfect Advanced Applications for Office Related Projects (Newspaper, Parallel, and Math Columns)." It was given three times the week of July 21. Fourteen staff members and two faculty members attended this course.
- The final course was "WordPerfect Advanced Applications - Merge Capabilities." It was given three times the week of July 28. Twelve staff members and five faculty members attended this course.

These courses will be repeated starting September. There is still a waiting list, so to add your name, send a memo or registration form to the Personnel Office. Regular courses like "Introduction to Lotus 1-2-3 Spreadsheet and Database," "WordStar," and "Introduction to WordPerfect," will resume in September also. Hopefully, a lot of you will have received your new NTPC's by then, so we will also offer a new round of "Introduction to Microcomputers and the DOS Operating System."

Video Training

You have probably been aware of the classroom training that Office Automation, in conjunction with the Personnel Office, offers for the faculty and staff at NTSU. Were you also aware that we have some training available on a check-out basis?

Individual training is available from FlipTrack Learning Systems. It consists of cassette tapes and booklets on the topics: "How to Use WordPerfect" and "How to Use MD-DOS".

Video training using a VCR VH Cassette, accompanying diskette and booklet, is also available for the following packages:

- The dBASE III Learning System (MicroVideo Learning Systems)
- Introduction to Lotus 1-2-3 (Learn-PC Video Systems)
- Macros and other Advanced Features of Lotus 123 (Learn-PC Video Systems)
- MS/PC-DOS, Using DOS With Hard Disk Systems (Anderson Soft-Teach)
- MS/PC-DOS Advanced DOS Commands for Hard Disk Systems (Anderson Soft-Teach).

These are located in the Computer Training Lab and Information Center, Marquis Hall, Room 105. Classes are also held in this room, so please call Sandy Franklin at 565-3856 to be sure someone will be in the room to handle your request. You will be asked to sign a "Notice and Agreement of Legal Obligations for Microcomputer Software Use" form if you decide to check-out a course. §

LOTUS 1-2-3 - Using Printer Setup Strings

By Sandy Franklin, Office Automation Specialist

The June 1987 issue of *LOTUS - Computing for Managers and Professionals* included an article entitled "Controlling your Printer with Setup Strings" by Paula Dempsey. Since I had received several calls during the past few months regarding this very problem, it was very timely for me. Included in this article was a chart that actually shows the setup strings necessary to have your printer print in compressed print, elite print, pica print, expanded print, double spacing, standard spacing, 8 lines per inch, letter quality, emphasized print, underlined print, italic print, and to reset the printer. Printers included in this chart included C. Itoh 8510;

DEC LA100; Epson FX, MX or RX; HP LaserJet; HP ThinkJet; IBM 5182 Color Printer; IBM Color Jetprinter; IBM Graphics; IBM Proprinter; IBM QuietWriter; NEC 8023A; Okidata Microline; Okidata Pacemark; Star Micronics Gemini; TI 850, 855, 865; Toshiba P351, P1350, P1351.

To tell 1-2-3 to instruct the printer to use compressed print or any other special print, press slash (/), Select Print Printer Options Setup, and enter the appropriate setup string. For example:

/

Print

Printer

Options

Setup

\015 (the setup string for the Epson FX Printer to do compressed print)

This will cause the entire spreadsheet to be printed in compressed print. Until you specify another setup string that

resets the printer or until you turn off your printer, all your printouts will appear in the specified mode.

Lotus 1-2-3 Releases 2 and 2.01 allow you to embed a setup string within the spreadsheet to change the print mode for an entire range of text. 1-2-3 does not allow you to specify more than one print mode within a label. To embed a setup string, you first insert a blank row above the row where you want the print mode to start or stop. Then position the pointer in the leftmost cell of the print range within the inserted row and enter two split vertical bars (| |), followed by the setup string. When you enter a setup string, don't worry that only one split vertical bar appears before the setup string -- 1-2-3 doesn't display the first split vertical bar.

When you print, the setup strings that appear on your screen will not appear on the printout. Moreover, 1-2-3 won't print any row beginning with two split vertical bars. I will give some of the setup strings for the Epson FX, MX or RX printers, the HP LaserJet, the IBM Proprinter, and the TI 850, 855, 865 printers. If you need the strings for one of the other printers mentioned earlier, please contact me at 565-3856, and I will give you a copy of the article.

	EPSON FX	HP LASERJET	IBM PROPRINTER	TI 855/865
Compressed	\015	\027&k2S	\015	\027P
Elite	\027M	\27(s12H	\027\058	\027z
Pica	\027P	\027&k0S	\018	\027y
Expanded	\027W1		\027\087\001	\027F (every pg)
Double Spacing	\027\065\024	\027&l3D		\027\028\049
Standard Spacing	\0272	\027&l6D		\0272
8 lines/inch	\0270	\027&l8D	\027\048	\0270
Letter Quality			\027I2	\027q
Emphasized	\027E	\027(s3B	\027E	\027G
Cancel Emphasized	\027F			\027H
Underlined	\027-1	\027&dD	\027\045\001	
Cancel Underlined	\027-0			
Italic	\0274			
Cancel Italic	\0275			
Master Reset	\027@	\027E		\027@

Note: in HP LaserJet Codes, there is a difference in the number 1 and the lowercase L. For Double Spacing, Standard Spacing, and 8 lines per inch, the uppercase L is used. The number 1 is used in the Elite setup string.

In all of the above setup strings, the number 0 is used, and not Uppercase O.

When Uppercase letters are shown, do not use the lowercase letter, and vice versa. It could make a difference. §

Micro-Tips

This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the *Benchmarks* editor for possible inclusion in a future issue.

Hard Disk Organization

Hard disks are great for storing mass quantities of data for fast retrieval. Organizing all of the files which can be put on hard disks is not difficult if you follow a couple of basic ideas, and learn the following simple DOS commands.

One of the fundamental ideas to keep in mind is that you should store files in sub-directories, NOT the root directory! The only files you should have in the root directory are COMMAND.COM, AUTOEXEC.BAT and CONFIG.SYS. In fact, as a part of the installation and setup of a new PC (after formatting the hard disk so that you can boot from it) you should copy all of the MS-DOS files into a \DOS sub-directory.

Sub-directories can have many levels, and family trees provide a useful analogy. First of all, if YOU are the "root directory," then you can have as many children "sub-directories" as you want. Generating directories is as simple as issuing a MD (make directory) command:

```
MD SUBNAME <RETURN>
```

where SUBNAME is the name of the directory you wish to create. If you type DIR <RETURN>, you will see that a new directory has been created.

To make this new sub-directory the default, use the CD (change directory) command:

```
CD SUBNAME <RETURN>
```

A DIRectory listing will now list the files in the SUBNAME sub-directory. New sub-directories can be generated from any level the same way, by executing the MD command when the intended parent is the default sub-directory.

If you're wondering about the backslash (\) in a CD command, it actually becomes necessary when you are moving to a sub-directory which is not a direct parent or descendant of the one you are in. For example, to move from the WP to the WP\LETTERS sub-directory, I would enter:

```
CD LETTERS <RETURN>
```

However, if I was in the COMM\PCWS directory to start with, I would enter: CD\WP\LETTERS <RETURN>

When using directories, it is extremely useful to have a DOS prompt which always displays the current directory. By including the command, PROMPT \$P \$G in your AUTOEXEC.BAT file, you will get a prompt like this automatically: C:\STATS

Finally, you should try to strike a balance between the number of files you have and the number of sub-directories you generate. Generally, if you have more than 50 or 60 files in one sub-directory, you might consider generating another sub-directory and doing some reorganization.

Running Programs Using Batch Files

To use a hard disk effectively, it is a good idea to create separate directories for each of the programs you use.

However, if you use many different programs, moving from one to another can often be time-consuming, especially if you forget the directory's name that contains the program you want to use. One technique we have found to be useful is to create a separate directory on your hard disk named BATCH. Within this directory, you store short DOS batch files that execute your programs for you. For example, if you use Procomm to communicate with the mainframe systems and it is in a directory called C:\COMM\PROCOMM, you can create a batch file that will change to that directory and execute Procomm. The following example would create such a batch file (this assumes you are already in the BATCH directory):

```
COPY CON PC.BAT <RETURN>
CD\COMM\PROCOMM <RETURN>
PROCOMM <RETURN>
<F6> <RETURN>          (press the F6 key)
1 file(s) copied
```

Next, you should add the following line to your AUTOEXEC.BAT file in your root directory:

```
PATH C:\BATCH
```

If you already have a PATH command, add a semicolon and C:\BATCH to the end of it. Once you have done this you will need to type AUTOEXEC <RETURN> from the root directory to make the new path effective. At this point, typing PC <RETURN> from any directory will automatically bring up Procomm. You can create a separate one- or two-letter batch file for every program and utility you use and they will be accessible no matter where you are on the hard disk at any one time.

Increasing Disk Buffers to Improve Performance

A buffer is a block of random access memory (RAM) that DOS uses to store data being read from or written to a disk. Each DOS buffer contains 128 bytes of data. Every time the operating system needs to read data from a disk, it checks to see if that data is contained in buffer memory. If it is, the disk access is avoided, thus speeding up system performance dramatically. Since each DOS buffer decreases the amount of available RAM by 528 bytes, the creators of DOS chose to establish a default of 2 buffers to accommodate users with small amounts of RAM. However, since most users at NTSU have 640K RAM in their PCs and very few programs need this much memory, increasing the number of buffers to 20 will result in noticeable improvements in system performance. This can be accomplished by inserting the following command in your CONFIG.SYS file, usually located in your root directory (if you have a hard disk) or on your boot disk (if you have 2 floppy disks): BUFFERS=20

If you don't have a CONFIG.SYS file in your root directory (or on your boot disk), you can create one by entering the following commands:

```
COPY CON FIG.SYS <RETURN>
BUFFERS=20 <RETURN>
<F6> <RETURN>          (press the F6 key)
1 file(s) copied
```

You will need to reboot your PC before the changes will become effective. Note that specifying too many buffers can result in decreased performance since it will take DOS longer to search the buffers than it would to actually read the data from your disk. §

VAXEN

DECNET and ETHERNET – A Winning Combination

By Ron Brashear, VAX System Manager (AC15@NTSUVAX)

DECNET is the term for the software that runs under VMS for the purpose of providing communications with other devices (running VMS or ULTRIX) that are connected to the same Ethernet. It provides an extremely useful, easy-to-manage software communications layer that allows for easy file transfer from node-to-node (a node is a machine residing on the Ethernet and DECNET can recognize up to 1024 such nodes on a Ethernet), but most importantly, it allows for a process running on one node to "set host" to another node and login for an interactive session on that node.

TEXNET is an example of a state-wide Ethernet that connects VAXes (via DECNET) in Universities throughout the state of Texas (NTSU expects to be part of this network in the near future). A user at NTSU could connect, for example, to the Cray supercomputer at UT Austin via TEXNET and the VAX 8600 that serves as the front-end processor for the Cray. One might also login to a VAX at University of Houston, or Texas A&M, etc. Such interactive logins must be done via proxy accounts established by the system manager of the respective machines. Once this is done, connecting (interactively) to these machines via DECNET consists of the `set host node_name` command followed by logging in on the node.

If Ethernet can function state-wide, it can obviously be made to function nicely locally (campus-wide). The GAB will eventually be wired with Ethernet cable to which machines (VMS, UNIX, etc) will be attached.

The Computer Science Dept. is currently purchasing a Thinwire Ethernet multiplexer that will allow for 8 Thinwire cables to attach to the baseband cable. These will support 29 stations/segment, each segment having a range of 180 meters. Broadband-to-baseband.

Ethernet modems can be obtained to allow DECNET to run on the the Sytek broadband Ethernet and then attach to baseband within a particular building. From this point, the cheaper Thinwire Ethernet may be attached to the baseband backbone. Ethernet also supports many protocols, including TCP/IP (UNIX) and many vendors produce products allowing a software communications interface between VMS and TCP/IP.

Watch this section of *Benchmarks* for more exciting information about DECNET, TEXNET and Ethernet. §

DECUS Software on the VAX

By Billy Barron (BILLY@NTSUVAX)

DECUS is a user group for VAX users. This organization also provides public domain software to its members. The public domain software is also called DECUS. The DECUS software contains many interesting utilities, games, information about the VAX, and some programs that plain don't work (sometimes these are the most fun). For example, the MORE utility was taken out of the DECUS software.

To get to the DECUS software, just type:
SET DEFAULT DECUS:[000000]

This will put you at the top level of the DECUS software. You will see lots of sub-directories. One of the subdirectories is called VAX000. In this directory, there are several files that start with AAAREADME. These files are the listings of what software DECUS is on our system. If you want to print out one of the lists, you use the PRT command. **Note: Do not send these lists to the VAX printers as they are rather large.**

These listings are categorized by VAX85C, VAX86A, etc. We do not have our DECUS files divided up that way. If a directory is listed as [VAX85C.INQUIRE], you would just type: SET DEFAULT DECUS:[INQUIRE] instead. About every 6 months or so, new DECUS software comes in.

The Computing Center does not have the obligation to support the DECUS software, nor is it supported by DECUS itself. However if you have any questions about it, send MAIL to OPERATOR. You use it at your own risk. Duplicate files have been removed to save on disk space. §

New System Disk Drive for VAXcluster

By James Shoffit, VAX Operator (James@NTSUVAX)

We have a brand new system disk drive (DUA0) for the VAXcluster! It is a 9-inch winchester disk drive, made by NEC and sold by Systems Industries. It has roughly twice the space that our old system disk drive had and will operate much faster. The new drive has a capacity of nearly 803 megabytes (formatted), and has an average seek time of 15 ms, compared to our old disk drive's statistics of 435 formatted megabytes and average seek time of 28 ms.

During our transition period, files will be moved from DUA1 to DUA0 in order to speed up system performance, and ease our current disk space shortage. Another benefit of having the new drive will be disk-to-disk daily backups which will decrease time for backups, and will allow us to do backups at low-usage times. f

OPERATIONS

Disk Backup Schedules

Backup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems on the NAS CPU and their contents is done once every two weeks at some low activity period over a weekend.

MUSIC/SP Backup Hours

A message will be sent to all users signed on to MUSIC/SP approximately 10 minutes before backups are begun. It will be in the form ** MUSIC SHUT DOWN AT xxxx AM - SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC/SP, enter **HELP HOURS**. The following backup schedule is currently in effect:

Tuesday 3 a.m. (for about 3 hours) Weekly backup

Wednesday - Saturday 4 a.m. (for about 2 hours) Daily backup

Saturday Midnight (for about 2 hours) Daily backup

PHOENIX Backup Schedule

PHOENIX is backed up weekly on Sunday night. The backup begins at midnight and lasts for approximately 30 minutes.

VAX Backup Schedule

Incremental backups of the VAXcluster are performed Monday through Thursday at 6 p.m. Users do not have to log-off, but any files that are open at the time of the backup will **NOT** be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log-off, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done once every two months. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shut-down for this. Watch the system log-on message for specific times and dates.

NOTE: Requests for restoration of files should be made via MAIL to the username OPERATOR. Your file can only be restored if it existed before the last backup was done. §

NAS/8083 Dual Processor Performance Statistics for June

CPU	SYSTEM	Scheduled Operating Hours	Planned Maintenance Hours	Planned Production Hours	Unplanned Maintenance Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP3	720	0.00	720.00	13.60	706.40	98.0%
ACAD	MUSIC/SP	720	28.34	691.66	14.04	677.62	98.0%
ACAD	MVS/JES2	720	0.00	720.00	15.59	704.71	97.9%
ACAD	COMPLETA	720	0.00	720.00	16.49	703.51	97.7%
ADMN	MVS/JES2	720	0.00	720.80	2.87	717.13	98.7%
ADMN	COMPLETA	291	0.00	291.00	3.83	287.17	98.7%
ADMN	ADABASA	720	15.67	704.33	11.38	692.95	98.4%

System Uptime = (Production Hours Achieved) /
(Planned Production Hours)

Production Hours Achieved = (Planned Production) - (Unplanned Maintenance)

Scheduled Operating Hours = (Planned Maintenance) +
(Planned Production)

MUSIC/SP Planned Maintenance Hours include 19.96 hours for system backup and 8.38 hours for VM/SP3 system back-up.

ADABASA'S Planned Maintenance Hours include 15.67 hours for system backup.

The ACAD CPU achieved 98% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime. The ADMN CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes ->

Operations Trivia

- There are approximately 10,000 tapes in the NTSU Tape Library. One 2400 foot reel of magnetic tape, written at 6250 BPI, could hold approximately 48 copies of a book such as an encyclopedia containing about 2.5 million characters (the encyclopedia would be about 2 1/2 inches thick).
- On A4D or B4D 7380 Disk Unit could store about one thousand of these books.
- The current total disk storage space for the 8083 Dual Processor would hold about 10,800 of these books. §

ACAD CPU:

CPU, Tape and Disk Subsystems (NAS)

1. Erratic voltage in Power Distribution Unit (PDU) causing floppy disk failures in ACAD CPU. 14.59 HOURS

Miscellaneous

1. Undetermined causes for systems restarts. 0.78
 2. COMPLETA shut down to process single jobs. 0.95
 3. MVS/JES2 System Tuning/Improvements 0.30
- TOTAL: 2.03 HOURS
- GRAND TOTAL FOR ACAD: 16.62 HOURS

ADMN CPU:

CPU, Tape and Disk Subsystems (NAS)

1. Scheduled power down of the ADMN CPU while resolving voltage problem with ACAD CPU. 2.55 HOURS

Miscellaneous

1. MVS/JES2 system tuning/improvements. 0.58
 2. COMPLETA system failures. 2.87
 3. ADABASA system shut down for file maintenance. 7.87
 4. COMPLETA system down to process single jobs. 0.38
- TOTAL: 11.70 HOURS
- GRAND TOTAL: 14.25 HOURS

NAS/8083 Dual Processor Performance Statistics for July

CPU	SYSTEM	Scheduled Operating Hours	Planned Maintenance Hours	Planned Production Hours	Unplanned Maintenance Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP3	744	0.00	744.00	1.80	742.20	99.0%
ACAD	MUSIC/SP	744	39.34	704.66	2.74	701.92	99.6%
ACAD	MVS/JES2	744	0.00	744.00	2.57	741.43	99.7%
ACAD	COMPLETA	744	0.00	744.00	2.91	741.09	99.6%
ADMN	MVS/JES2	744	0.00	744.00	0.15	743.85	99.9%
ADMN	COMPLETA	308	0.00	308.00	1.32	306.68	99.6%
ADMN	ADABASA	744	17.50	726.50	6.75	719.75	99.1%

System Uptime = (Production Hours Achieved)/(Planned Production Hours)

Production Hours Achieved = (Planned Production) - (Unplanned Maintenance)

Scheduled Operating Hours = (Planned Maintenance) + (Planned Production)

MUSIC/SP Planned Maintenance Hours include 24.21 hours for system backup and 15.13 hours for VM/SP3 system backup.

ADABASA'S Planned Maintenance Hours include 17.50 hours for system backup.

The ACAD CPU achieved 99.8% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 99.9% uptime. The ADMN CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes ->

ACAD CPU:

CPU, Tape and Disk Subsystems (NAS)

- | | |
|--|------------|
| 1. Floppy disk failure in service processor. | 2.25 HOURS |
| 2. Unit 382 dropped ready on 7380 DASD. | 0.30 |

Miscellaneous

- | | |
|--|------|
| 1. Undetermined causes for systems restarts. | 0.42 |
| 2. MVS/JES2 System Tuning/Improvements. | 0.30 |

TOTAL: 2.45 HOURS

GRAND TOTAL FOR ACAD: 3.50 HOURS

ADMN CPU:

Miscellaneous

- | | |
|--|------|
| 1. Undetermined causes for system restarts. | 0.65 |
| 2. ADABASA system shut down for file maintenance | 6.33 |
| 3. COMPLETA system down to process single jobs. | 0.67 |

TOTAL: 7.65 HOURS

GRAND TOTAL: 7.65 HOURS

INFORMATION SYSTEMS

COM-LETE Program Services

By Douglas Heruska, Documentation Specialist

The COM-PASS menu of COM-LETE provides the ability to access programs using a one letter identifier or through a specified PF Key. This function allows for faster and easier program access. The right hand side of the COMPASS menu consists of a Service Description, Program acronym, letter ID, and PF Key identifier for a program (see below). Each person can have their USER-ID customized for their needs. There is a limit of nine program functions available to each USER-ID, which are set up through the COM-LETE security system. Some USER-ID, which are set up through the COM-LETE security system. Some of the more common program access codes used are:

- SIMS
- ULOG
- UQ

- UPDS
- CEDIT
- SET(logoff)
- MAIL
- REFF
- VREF
- USERS
- TREF

Any USER-ID with security clearance on a program access can have a COM-PASS Menu setup with this ability (See figure). If you do not currently have this function on your USER-ID and/or want to modify your USER-ID, contact me at the Computing Center at (565-2324). This service is limited to Faculty and Staff with COM-LETE access.

NOTE: COM-LETE has a limit of 72 different program access codes available to all COM-PASS screens.

```

14:51:13      TID    93      --  ADMIN PRD      USER ID AI55      08/27/87
                                COM-PASS --              USTK

  SUSPENDED PROGRAMS                                PROGRAM SERVICES
-----
PROGRAM  NAME      LEVEL  PF      SERVICE DESCRIPTION  PROGRAMS  ID  PF
-----
                                MONITOR QUEUE        UQ        A  04
                                MAINTAIN USER PDS    UPDS       B  05
                                SOURCE EDITOR         CEDIT      C  06
                                DEVL DB NATURAL       NTNATD     D  07
                                TAPE MANAGEMENT INQ   TMSINQ     E  08
                                USERID MAINTENANCE    USERID     F  09
                                DOCUMENT INDEX NUMS   DIN         G  10
                                ELECTRONIC MAIL       MAIL        H  11
                                LOGOFF               RSET        I  12

                                HELP          ?

ENTER INPUT:

```

TECHNICAL SUPPORT

ACADemic (NAS) Program Hit Parade*

The following programs were used the most frequently on the NAS CPU during the month of July.

JULY TOP TEN PROGRAMS : FREQUENCY OF RUNS

Program	Description	Number of Runs	Percent of Total
1.IEWL	Linkage Editor	14578	16.4
2.PGM = *.DD	Compiled Program	14358	16.2
3.IKFCBL00	VS COBOL Compiler	12235	13.8
4.IEBPTPCH	IBM List Utility	11591	13.0
5.IEBGENER	IBM Utility	5991	6.7
6.CSMA001	Sort Utility	5116	5.8
7.SCRIPT	Waterloo/SCRIPT	4523	5.1
8.IEFBR14	IBM Null Utility	4192	4.7
9.SASLPA	SAS	4083	4.6
10.IEV90	Assembler H	2821	3.2

JULY TOP TEN PROGRAMS: CPU SECONDS USED

Program	Description	CPU Seconds	Percent of Total
1.SPSSX	SPSSX	37013	20.4
2.SASLPA	SAS	34620	19.1
3.PGM = *.DD	Compiled Program	29825	16.4
4.IKFCBL00	VS COBOL Compiler	22105	12.2
5.SCRIPT	Waterloo/SCRIPT	17478	9.6
6.PTPCH	Dataset Lister	5074	2.8
7.IEBPTPCH	IBM List Utility	4418	2.4
8.GIMSMP	MVS Maintenance Utility	4399	2.4
9.CSMA001	Sort Utility	4052	2.2
10.IEWL	Linkage Editor	3698	2.0

*ACAD is the official designation of the part of the NAS/8083 CPU that is dedicate to faculty and student use. The portion of the computer reserved for Univers' ministrative purposes is termed ADMN.

Registration Form for Computing Center Short Courses

Please complete this form and return it AS SOON AS POSSIBLE if you wish to attend any of the short courses listed below. You may also register over the phone by calling 565-2324.

NAME: _____ PHONE: _____

DEPT: _____ CLASSIFICATION: _____

I wish to attend:

● **Introduction to MUSIC/SP, Part I (ISB 110):**

___ Saturday, September 19: 9-11 a.m.

___ Monday, October 19: 9-11 a.m.

___ Monday, September 21: 6-8 p.m.

___ Tuesday, October 20: 3-5 p.m.

___ Tuesday, September 22: 1-3 p.m.

___ Wednesday, October 21: 1-3 p.m.

● **Introduction to MUSIC/SP, Part II (ISB 110):**

___ Thursday, September 24 : 9-11 a.m.

___ Tuesday, October 27: 6-8 p.m.

● **Introduction to IBM JCL (Graphics Lab, ISB):**

___ Tuesday, September 22 : 3-5 p.m.

___ Wednesday, October 21: 1-3 p.m.

● **Introduction to SAS (ISB 110):**

___ Thursday, September 24: 1-3 p.m.

___ Thursday, October 22: 6-8 p.m.

● **Introduction to SPSS-X (ISB 110):**

___ Wednesday, September 23: 3-5 p.m.

___ Monday, October 26: 6-8 p.m.

● **File Handling With SAS, SPSS^X & BMDP (Graphics Lab, ISB):**

___ Wednesday, September 30: 9-11 a.m.

___ Friday, October 30: 1-3 p.m.

● **Introduction to SAS/GRAPH (Graphics Lab, ISB):**

___ Wednesday, September 29: 1-3 p.m.

___ Tuesday, October 27: 3-5 p.m.

● **Introduction to CMS (Graphics Lab, ISB):**

___ Monday, September 21: 1-3 p.m.

___ Monday, October 26: 3-5 p.m.

● **Introduction to VAX/VMS, Part I (ISB 110):**

___ Wednesday, September 23: 6-9 p.m.

___ Thursday, October 22: 2-5 p.m.

● **Introduction to VAX/VMS, Part II (ISB 110):**

___ Thursday, September 29: 9-11 a.m.

___ Wednesday, October 28: 1-3 p.m.

● **Introduction to BitNet (ISB 110):**

___ Monday, September 28: 9-11 a.m.

___ Wednesday, October 28: 3-5 p.m.

● **I would like to see more classes offered:** ___ on weekends; ___ at night.

The classes I am interested in are: _____

**Academic Computing Services
The Computing Center
NT Box 13495
North Texas State University
Denton, TX 76203**
